

CLAIMS

What is claimed is:

- 1 **1.** A rack system for carrying cargo items on a vehicle having a substantially vertical
2 surface, a bumper, and a hitch receiver, the rack system comprising:
3 bumper connectors for coupling to the bumper;
4 vertical rails;
5 horizontal rails connected to the vertical rails;
6 at least one of the vertical rails and the horizontal rails coupled to the bumper connectors;
7 and
8 support bars extending substantially longitudinally and coupled to at least one of the
9 vertical and horizontal rails, for supporting the cargo items.
- 1 **2.** The rack system of claim 1 wherein the substantially vertical surface comprises a back
2 end of the vehicle, and the bumper comprises a rear bumper at the back end.
- 3 **3.** The rack system of claim 1 further comprising:
4 a tray for supporting weight of the cargo items.
- 1 **4.** The rack system of claim 3 wherein:
2 the tray is adapted for coupling to the hitch receiver.
- 1 **5.** The rack system of claim 3 further comprising:
2 at least one stabilizer bar coupled to the tray and to a bumper connector.
- 1 **6.** The rack system of claim 3 further comprising:
2 a combination lockbox securely coupled to the tray.
- 1 **7.** The rack system of claim 1 further comprising:
2 rail connectors coupling the horizontal rails to the vertical rails.

1 8. The rack system of claim 7 wherein:
2 at least some of the rail connectors are movable to enable repositioning of at least one of
3 the rails.

1 9. The rack system of claim 1 wherein:
2 the at least one of the vertical rails and the horizontal rails is pivotably coupled to the
3 bumper connectors.

1 10. The rack system of claim 9 further comprising:
2 a spring coupled to at least one of the bumper connectors to maintain an upper portion of
3 the rack system against the vehicle under pressure.

1 11. The rack system of claim 1 further comprising:
2 at least one pad coupled to the rails to protect the vehicle from damage by the rack
3 system.

1 12. The rack system of claim 1 further comprising:
2 bar connectors coupling the support bars to the rails.

1 13. The rack system of claim 12 wherein:
2 at least one of the bar connectors is movable to enable repositioning of its support bar to
3 adapt the rack system for carrying different cargo items.

1 **14.** A cargo rack for carrying elongated cargo such as surfboards on a substantially vertical
2 surface of a vehicle such as an RV, the cargo rack comprising:
3 bumper connectors for coupling to a bumper of the vehicle;
4 vertical rails coupled to the bumper connectors;
5 horizontal rails coupled to the vertical rails;
6 support bars coupled to the horizontal rails and extending backward for holding the
7 elongated cargo in position; and
8 a tray for coupling to a hitch receiver of the vehicle, for bearing the weight of the
9 elongated cargo.

- 1 15. The cargo rack of claim 14 wherein the substantially vertical surface comprises a back
2 end of the vehicle, and the bumper comprises a rear bumper of the vehicle.
- 3 16. The cargo rack of claim 14 wherein:
4 at least one of the horizontal rails is slidably coupled to the vertical rails.
- 1 17. The cargo rack of claim 16 wherein:
2 at least one of the support bars is slidably coupled to the horizontal rails.
- 1 18. The cargo rack of claim 14 further comprising:
2 at least one stabilizer coupled to the tray and to one of a bumper connector and a vertical
3 rail.
- 1 19. The cargo rack of claim 14 further comprising:
2 springs coupled to the vertical rails and to the bumper connectors for pressing the cargo
3 rack against the back of the vehicle.
- 1 20. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for being mounted to the vehicle without any modifications of
3 the vehicle, with the cargo rack being connected to the vehicle only at the bumper and the
4 receiver hitch.
- 1 21. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying at least one surfboard.
- 1 22. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying at least one of a canoe and a kayak.
- 1 23. The cargo rack of claim 14 wherein:
2 the cargo rack is adapted for carrying a ladder.

1 24. The cargo rack of claim 14 wherein:
2 the support bars can be repositioned to adapt the cargo rack for carrying a variety of
3 cargo items.

1 **25.** A vehicle comprising:
2 a frame;
3 a body coupled to the frame;
4 a bumper coupled to the frame at a rear of the body;
5 a hitch receiver coupled to the frame at the rear of the body;
6 a cargo rack coupled only to the bumper and including,
7 vertical rails,
8 horizontal rails coupled to the vertical rails, and
9 support bars coupled to the horizontal rails for holding cargo items in position;
10 and
11 a tray coupled to the hitch receiver for bearing the weight of the cargo items.

1 26. The vehicle of claim 25 wherein the vehicle comprises:
2 one of an RV, a trailer, a truck, a camper, an SUV, and a passenger car.

1 27. The vehicle of claim 25 wherein:
2 the support bars are movably coupled to the horizontal rails, whereby they may be
3 repositioned to adapt the cargo rack for use with a variety of cargo items.

1 **28.** An apparatus for use with a motor vehicle and a trailer, the apparatus comprising:
2 first means for carrying cargo items;
3 second means, coupled to the first means, for coupling to a hitch receiver of the motor
4 vehicle;
5 third means, coupled to one of the first means and the second means, for coupling to a
6 hitch of the trailer;
7 whereby the motor vehicle is enabled to simultaneously carry the cargo items and tow the
8 trailer.

- 1 29. The apparatus of claim 28 wherein:
2 the first means comprises a tray.
- 1 30. The apparatus of claim 28 wherein:
2 the first means comprises a rack.
- 1 31. The apparatus of claim 28 wherein:
2 the third means comprises a hitch receiver for coupling to a removable hitch module.
- 1 32. The apparatus of claim 31 further comprising:
2 the hitch module.
- 1 33. The apparatus of claim 28 wherein:
2 the third means comprises an integral hitch to which a ball may be coupled for towing the
3 trailer.